

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No. : 10/653,350 Confirmation No.: 3503  
Applicant : Eun Jung Lee  
Filed : September 2, 2003  
TC/A.U. : 1647  
Examiner : Seharaseyon, Jegatheesan  
Docket No. : 027707.00017  
Customer No. : 38485  
For : GLYCOSYLATED HUMAN INTERFERON ALPHA ISOFORM

**AMENDMENT AFTER NOTICE OF ALLOWANCE**  
**IN ACCORDANCE WITH 37 C.F.R. 1.312**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

This post allowance communication is submitted in response to the Notice of Allowance dated August 8, 2007.

A Response was filed on May 15, 2007 in response to the Office Action mailed on November 15, 2006 for the above-referenced patent application.

At the time of filing the response (May 15, 2007), a replacement figure was submitted for figure 8. I have attached for your convenience a copy of the Response as filed, along with a copy of the USPTO stamped return receipt postcard.

Applicant received the Notice of Allowance dated August 8, 2007 in which we noted that acknowledgment of the replacement figure 8 was not made.

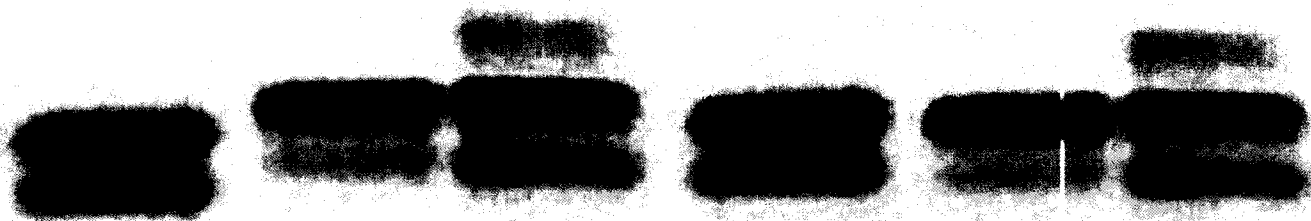
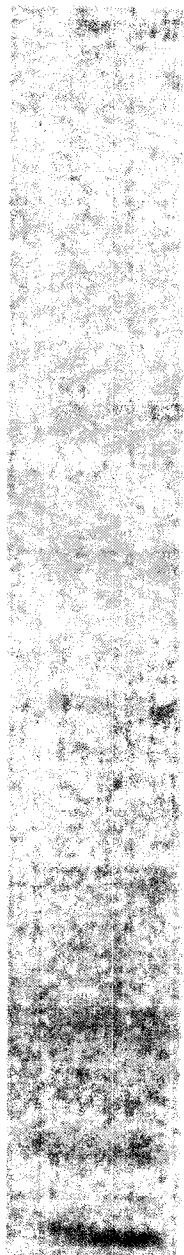
Applicant respectfully requests that the attached replacement figure 8 be considered and accepted for the above-referenced patent application.

Applicant believes that no additional fees are required in connection with this response. However, if additional fees are required, the Commissioner is hereby authorized to charge any additional payment, or credit any overpayment, to Deposit Account No. 01-2300, referencing Docket Number 027707.00017.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read 'Marylee Jenkins', is written over a horizontal line.

Marylee Jenkins  
Registration No. 37,645  
ARENT FOX LLP  
1675 Broadway  
New York, NY 10019  
Tel. No. (212) 484-3945  
Fax No. (212) 484-3990  
Customer No. 38485



**Replacement Figure 8**  
**Application No. 10/653,350**  
**Title: Glycosylated Human Interferon Alpha Isoform**  
**Attorney Docket No.: 027707-00017**

Appln. No. 10/653,350  
Reply to Office Action of November 15, 2006  
Response dated May 15, 2007

**COPY**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No. : 10/653,350 Confirmation No.: 3503  
Applicant. : Eun Jung Lee  
Filed : September 2, 2003  
TC/A.U. : 1647  
Examiner : Seharaseyon, Jegatheesan  
Docket No. : 027707.00017  
Customer No. : 38485  
For : GLYCOSYLATED HUMAN INTERFERON ALPHA ISOFORM

**RESPONSE**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

This paper is submitted in response to the Office Action dated November 15, 2006.

**Amendments to the Claims** are reflected on page 2 of this paper.

**Remarks** begin on page 5 of this paper.

I hereby certify that this correspondence is being deposited in the U.S. Patent and Trademark Office via First class mail to the Commissioner for Patents.

May 15, 2007

Rochelle K. Seide  
Rochelle K. Seide, Reg. No. 32,300

**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Canceled)
2. (Canceled)
3. (Withdrawn) An isolated nucleic acid encoding the recombinant human interferon alpha isoform of claim 1.
4. (Withdrawn) The isolated nucleic acid according to claim 3, wherein the encoded recombinant human interferon alpha isoform comprises the amino acid sequence of SEQ ID NO:1 modified to contain at least one N-glycosylation motif with the sequence Asn-Xaa-Ser/Thr such that the asparagine residue of the motif occurs at a site selected from the group consisting of Cys1, Asp2, Pro4, Gln5, Thr6, His7, Ser8, Arg22, Arg23, Ile24, Ser25, Leu26, Phe27, Ser28, Cys29, Leu30, Lys31, Asp32, Arg33, His34, Asp35, Phe36, Gly37, Pro39, Gln40, Glu41, Glu42, Phe43, Gly44, Asn45, Gln46, Phe47, Gln48, Lys49, Ala50, Glu51, Thr52, Ser68, Asp77, Lys134, Tyr135, Ser136, Gln158, Glu159, Ser160, Leu161, Arg162, Ser163, Lys164, and Glu165.
5. (Withdrawn) An expression vector comprising the nucleic acid of claim 3.
6. (Canceled)
7. (Canceled)

8. (Canceled)
9. (Canceled)
10. (Withdrawn) A method for producing an N-glycosylated human interferon alpha isoform comprising:  
  
culturing a eukaryotic host cell transformed or transfected with the expression vector of claim 8 under conditions that permit expression of the encoded recombinant human interferon alpha isoform; and  
  
isolating the expressed recombinant human interferon alpha isoform from the culture.
11. (New) A recombinant human interferon alpha isoform comprising the amino acid sequence of SEQ ID NO: 1 that has been modified such that His 34 has been replaced by Asn and Phe 36 has been replaced by Ser.
12. (New) A recombinant human interferon alpha isoform comprising the amino acid sequence of SEQ ID NO: 1 that has been modified such that His 34 has been replaced by Asn, Phe 36 has been replaced by Ser and Leu 26 has been replaced by Asn.
13. (New) A recombinant human interferon alpha isoform comprising the amino acid Sequence of SEQ ID NO: 1 that has been modified such that His 34 has been replaced by Asn, Phe 36 has been replaced by Ser and Lys 134 has been replaced by Asn.

**COPY**

14 (New) A recombinant human interferon alpha isoform having the sequence of SEQ ID NO: 1 that has been modified such that His 34 has been replaced by Asn, Phe 36 has been replaced by Ser, Leu 26 has been replaced by Asn and Lys 134 has been replaced by Asn.

15. (New) A pharmaceutical composition comprising the recombinant human interferon alpha isoform according to any one of claims 11 to 14 and a pharmaceutically acceptable carrier.

**REMARKS**

This is in response to the Office Action mailed November 15, 2006 in the above-identified application. A three-month extension of time for response is requested and the required fee is enclosed.

The present application is directed to glycosylated human interferon alpha isoforms having increased stability in vivo.

Claims 1, 2, and 6-9 are pending and under examination. Claims 3-5 and 10 are withdrawn from consideration.

By this amendment, Claims 1, 2 and 6-9 have been canceled and Claims 11-15 have been added to more particularly define the present invention. Claims 11-15 are supported by the specification, inter alia, at paragraphs 44, 50, 53, 80 and 106-120. Thus, the amendments do not constitute new matter.

The Examiner has objected to Figure 8 as being unclear and providing no useful information. A replacement Figure 8 is enclosed which, applicants submit, should overcome the objection.

Claims 1, 2, 6, 7 and 9 have been rejected. These claims have been canceled and replaced by new Claims 12-15.

Claim 8 has been objected but deemed allowable if rewritten in independent form. Claim 8 has been replaced by new Claim 11 which should be allowable.

Claims 1 and 2 have been rejected under 35 USC §112 ¶1 as lacking enablement for the full scope of the claims. Claims 1 and 2 have been canceled, and replaced by Claims 11-15.



Applicants maintain that new Claims 11-15 are fully enabled by the specification. Claims 11-15 define human interferon alpha isoforms having the amino acid sequence of SEQ ID NO: 1 (admittedly enabled by the Examiner in the Office Action) in which certain defined amino acid substitutions have been made to provide increased in vivo stability. Claim 11 has essentially the same scope as original Claim 8 which the Examiner has deemed allowable.

The modifications in SEQ ID NO: 1 in each of the claims is as follows:

Claim 11	His 34 → Asn; Phe 36 → Ser
Claim 12	His 34 → Asn; Phe 36 → Ser; Leu 26 → Asn
Claim 13	His 34 → Asn; Phe 36 → Ser; Lys 134 → Asn
Claim 14	His 34 → Asn; Phe 36 → Ser; Leu 26 → Asn and Lys 134 → Asn

The specification clearly teaches each of these isoforms and their preparation (e.g. paragraphs 106-120) as well as showing they have increased stability (e.g. Figures 8 and 9). In view of the amendments herein, Applicants maintain that the rejection of Claims 1 and 2 as lacking enablement is obviated and that the isoforms defined by Claims 11-15 are clearly enabled and, thus, allowable.

Claims 1 and 2 have been rejected as lacking an adequate written description. The Examiner has alleged that applicants did not have possession of the claimed subject matter at the time of filing.

In view of the amendments to the claims, Applicants maintain that they are clearly in possession of the presently claimed invention. The interferon alpha isoforms of Claims 11-15 are clearly described in the present application in a way showing that the

inventors had possession of the claimed subject matter. Applicants, thereby, request that the lack of adequate written description rejection be withdrawn.

Claims 1 and 2 have been rejected under 35 USC §103(a) as obvious over Nyman et al. in view of U.S. Patent No. 6,309,118 to Margolin et al.

Nyman teaches an interferon alpha isoform (IFN -  $\alpha$  - 14c) that has a glycosylation site at Asn 72. Margolin et al. teach carbohydrate moieties attached to glycoproteins through the hydroxyl side chains of threonine and serine or through the amide nitrogen side chain of asparagine. Margolin et al. also teaches that the addition of such carbohydrate moieties help to increase the stability of the protein.

However, the combination of Nyman and Margolin neither teaches nor suggests the presently claimed interferon alpha isoforms. Indeed, the Examiner indicates that original Claim 8 which corresponds to present Claim 11 is patentable. In view of the amendments to the claims, Applicants maintain that the obviousness rejection of Claims 1 and 2 over Nyman in view of Margolin has been obviated and that Claims 11-15 are allowable.

Claims 6, 7 and 9 have been rejected as obvious over Goeddel et al. (U.S. Pat. No. 6,482,613) in view of Sekellick et al. (U.S. Pat. No. 6,020,465) and Apweiler et al.

Goeddel provides a recombinant human interferon alpha isoform in *E. coli*: (which would not be glycosylated). The glycosylation motif "NXS/T" is not provided. Apweiler provides the glycosylation motif NXS/T (where X is any amino acid except Proline) required for glycosylation of a protein. Sekellick teaches that glycosylated proteins may be recombinantly produced in CHO cells and that N-glycosylation increases stability.

Applicants maintain, however, that the combination of these references neither teach nor suggest the presently claimed interferon alpha isoforms (as already acknowledged by the Examiner in indicating that original Claim 8 constituted allowable subject matter). In view of the present amendments, Applicants assert that the obviousness rejection over the combination of Goeddel, Apweiler and Sekellick has been obviated and that Claims 11-15 should be allowed.

Applicants maintain that, in view of the amendments and remarks herein, Claims 11-15 constitute allowable subject matter. A Notice of Allowance is respectfully requested.

This paper is submitted in response to the Office Action dated November 15, 2006.

A three-month extension of time for response is respectfully requested. Payment of the extension fee is to be made by Credit Card. Applicants believe that no additional fees are required in connection with this response. However, if additional fees are required, the Commissioner is hereby authorized to charge any additional payment, or credit any overpayment, to Deposit Account No. 01-2300, **referencing Docket Number 027707.00017.**

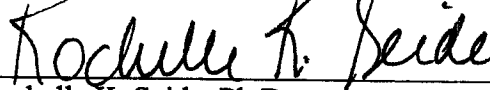
Appln. No. 10/653,350

Reply to Office Action of November 15, 2006

Response dated May 15, 2007

**COPY**

Respectfully submitted,



Rochelle K. Seide, Ph.D.

Registration No. 32,300

ARENT FOX LLP

1675 Broadway

New York, NY 10019

Tel. No. (212) 484-3945

Fax No. (212) 484-3990

Customer No. 38485

**COPY**

**FEE CALCULATION**

Any additional fee required has been calculated as follows:

\_\_\_ If checked, "Small Entity" status is claimed.

	(Column 1)	(Column 2)	(Column 3)	SMALL ENTITY			LARGE ENTITY	
	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NO. PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE	ADD'L FEE	OR	RATE	ADD'L FEE
TOTAL CLAIMS	6 MINUS	20	= 0	x \$25	\$		x \$50	\$0.00
INDEP CLAIMS	2 MINUS	3	= 0	x \$100	\$		x \$200	\$0.00
<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEP. CLAIM				+ \$180	\$	OR	+ \$360	\$0.00
					\$			\$0.00

The U.S. Patent and Trademark Office is hereby authorized to charge and deficiency or credit any overpayment of fees associated with this communication to Deposit Account No. 01-2300 referencing docket number 027707.00017.

**COPY**

This collection of information is required by 37 CFR 1.36(a). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.** *If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

COPY



Marker

Glycosylated IFN alpha

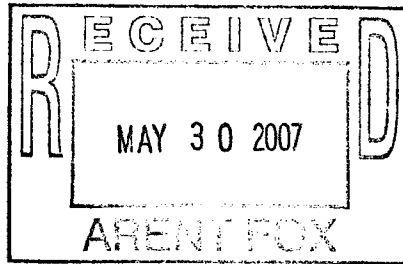
IFN

IFN- $\gamma$  (K110)

IFN- $\gamma$  (K110)

IFN- $\gamma$

IFN- $\gamma$  (K110)



**COPY**

Patent ☒ Trademark ☐ Docket No. 027707.00017  
Serial No. 10/653,350 Filed September 2, 2003  
Applicant(s) Eun Jung Lee  
Papers filed herewith on May 15, 2007  
☐ Fees \$            Ck #             
☐ New Application  
☒ Amendment  
☐ Notice of Appeal  
☐ IDS/PTO-SB08  
☒ Other 3-month extension of time fee \$1020; PTO-2028 Credit Card Form  
☐ Assignment (w/PTO-1595 Form)  
☐ Declaration  
☐ Priority Document  
☒ Req. for Ext. of Time  
☒ Drawing(s) Replacement Figure 8

*(Circular stamp: MAY 18 2007)*

Receipt is hereby acknowledged of the papers filed as indicated in connection with the above-identified case.

COMMISSIONER OF PATENTS

FILE NO. 027707.00017  
STATUS: Nov. 15, 2007  
FINAL:                       
ENTERED BY:                       
ATTY:



**COPY**

Patent ☒ Trademark ☐ Docket No. 027707.00017

Serial No. 10/653,350 Filed September 2, 2003

Applicant(s) Eun Jung Lee

Papers filed herewith on May 15, 2007

<input type="checkbox"/> Fees \$ <u>          </u> Ck # <u>          </u>	<input type="checkbox"/> Assignment (w/PTO-1595 Form)
<input type="checkbox"/> New Application	<input type="checkbox"/> Declaration
<input checked="" type="checkbox"/> Amendment	<input type="checkbox"/> Priority Document
<input type="checkbox"/> Notice of Appeal	<input checked="" type="checkbox"/> Req. for Ext. of Time
<input type="checkbox"/> IDS/PTO-SB08	<input checked="" type="checkbox"/> Drawing(s) Replacement Figure 8
<input checked="" type="checkbox"/> Other <u>3-month extension of time for \$1020; PTO-2038 Credit Card Form</u>	

Receipt is hereby acknowledged of the papers filed as indicated in connection with the above-identified case.

: **COMMISSIONER OF PATENTS**